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EXAMINER	
FOSTER, JUSTIN B	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/621,783	TANAHASHI ET AL.	
	Examiner	Art Unit	
	Justin Foster	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-50* is/are rejected.

7)☒ Claim(s) *5 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claim 5 is objected to because of the following informalities: The Examiner believes that the phrase "finishes a conversation process" should be changed to "finishes a conversion process". The claim as written does not fit into the scope of the specification. Appropriate correction is required.

2. Claim 12 is objected to because of the following informalities: The phrase "said data supplying controller including the plurality of processors, and wherein the data-supplying controller including the plurality of processors" is redundant. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear to what the phrase "the number of which" at the end of the claim refers to.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens (5,652,711) in view of Takashima (5,301,089). With regard to claim 1, Vennekens discloses an image processing method in a printing system (figure 1) including a plurality of processors (inherent from sub-process 1 & 2, elements 36 and 37 of figure 1) performing a conversion process from a page description language format of data into raster image data ("converting a data stream in page description language ... into a bitmap representation", column 1, lines 5-9), and a printing engine (marking engine 43, figure 1) which continuously receives color image data (bitmap representation 42, figure 1) having at least three color components ("cyan, magenta, yellow and black", column 1, line 40) in page unit (inherent from "each segment describes an image to be printed on an individual page", column 4, lines 7-9) and prints the at least three color components of color image data on a recording medium in parallel at a constant speed ("running on several processors parallelly", column 3, lines 9-13), the image processing method comprising the steps of: receiving a page description language format of data ("master process 32 receives the PDL data stream", column 5, lines 55-58) including at least two of the at least three color components (inherent when sending a color image) as at least an object constituting the page description format data (inherent from "PDL data stream 31", figure 1); analyzing the page description language format of data (column 6, line 19) and generating independent PDL stream segments (column 6, lines 20-23) for each processor (inherent from "each segment can be processed independently", column 6, lines 22-23) and producing raster image data (bitmap generation 41, figure 1) from each stream (combination 39, figure 1). Vennekens does not disclose assigning, based on the analysis, each color component data of the object in the received

data to each processor and causing the plurality of processors to perform the conversion process of the data of the at least two of the at least three color components in parallel and producing raster image data of each color component from the plurality of processors to the printing engine in parallel. Takashima teaches, in lines 22-31 of column 5, a parallel processing system where each color component for printing is processed with a different processor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to assign, based on the analysis of the data of Vennekens, each color component data of the object in the received data to each processor and to cause the plurality of processors to perform the conversion processes of the data of the at least two of the at least three color components in parallel; and to produce raster image data of each color component from the plurality of processors to the printing engine in parallel. This modification will improve the printing time by parallel processing the different print colors.

7. With regard to claim 2, Vennekens in view of Takashima discloses the invention as stated in claim 1. Vennekens further discloses wherein said receiving step receives a page description language format of data (PDL data stream 31, figure 1) including a plurality of pages ("one or more images or pages", column 1, line 7), each page of data having at least one object (inherent from PDL data stream, column 3, lines 29-48), and said assigning step assigns the objects of the plurality of pages to the plurality of processors so as for the plurality of processors to perform the conversion processes of the plurality of pages in parallel ("parallel Processing", column 6, lines 19-25).

8. With regard to claim 3, Vennekens in view of Takashima discloses the invention as stated in claim 2. Vennekens further discloses wherein said producing step stores the plurality of pages

of raster image data into a memory ("each processor has an independent memory", column 7, lines 3-9), and produces the stored raster image data in page unit to the printing engine ("bitmap representation is sent to a marking engine", column 14, lines 30-34).

9. With regard to claim 4, Vennekens in view of Takashima discloses the invention as stated in claim 1. Vennekens further discloses wherein the page description language format of data includes at least two of four color components (inherent with a color image) as at least an object constituting the page description language format data (inherent in PDL data stream, column 3, lines 29-48), and wherein the printing engine continuously receives raster image data of the at least two of the four color components in parallel ("bitmap representation is sent to a marking engine", column 14, lines 30-31) and prints them on the recording medium in parallel ("writes the image ... on the hard copy", column 14, lines 31-34).

10. With regard to claim 5, Vennekens in view of Takashima discloses the invention as stated in claim 3. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select a processor that finishes the raster image data conversion earlier than the others. This would increase the overall speed of the system.

11. With regard to claim 6, Vennekens in view of Takashima discloses the invention as stated in claim 5. Vennekens further discloses that each processor has a queue ("independent memory", column 7, line 4). It is inherent that the assigning step assigns each object to one of the queues of the processors, and each processor performs the conversion process based on information of the job stored in the queue. This must be the case since all processors have a queue ("independent memory") and all objects are assigned to a processor.

12. With regard to claim 7, Vennekens in view of Takashima discloses the invention as stated in claim 6. Vennekens further discloses wherein said assigning step assigns objects included in the received page description language format data without waiting to complete the conversion process of one page (inherent from "intermediate data stream portions", column 3, lines 15-16), and said producing step produces a page of raster image data stored in the memory in order (inherent from column 14, lines 28-36 since only one page can be produced at a time).

13. With regard to claim 8, Vennekens in view of Takashima discloses the invention as stated in claim 1. Takashima further discloses, in lines 22-31 of column 5, performing processing of yellow, cyan, magenta, and black simultaneously on different processors. This is equivalent to dividing data of color components constituting one object as a job into each color component data, and assigning each color component data to the plurality of processors.

14. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Takashima, as applied to claim 1 above, and in further view of Carelton, *et al.* (5,819,038). With regard to claim 9, the combination of Vennekens and Takashima discloses the invention as stated in claim 1. The combination does not disclose wherein the printing system having a conversion unit converting, into raster image data, file data other than the page description language format data, and wherein, in a case where the file data other than the page description language format data is received, said analyzing step recognizes, based on attribution information included in the received file data, that the file data other than the page description language format data has been received, and said assigning step assigns a job of the conversion process of the received file data to the conversion unit. Carleton teaches, in lines 64-65 of column 9, converting GDI data, which is data other than the page description language format

data, into raster data. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the printing system having a conversion unit converting, into raster image data, file data other than the page description language data. This would improve the versatility of the system by increasing the number of input data formats that could be used. It is inherent that in such a case, said analyzing step would recognize, based on attribution information included in the received file data, that the file data other than the page description language format data has been received, in order to properly handle the data. The assigning step would then assign a job of conversion process of the received file data to the conversion unit.

15. With regard to claim 10, the combination of Vennekens, Takashima and Carelton discloses the invention as stated in claim 9. Carelton further discloses, in lines 64-65 of column 9, that the file data in question is GDI, or Graphic Display Interface format of data.

16. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Takashima and Carelton, as applied to claim 9 above, and in further view of Alam, *et al.* (6,336,124). The combination of Vennekens, Takashima and Carelton discloses the invention as stated in claim 9. The combination does not disclose wherein the file data is an Extensible Markup Language format of data. Alam teaches converting from Extensible Markup Language (column 2, line 5) to bitmap (column 2, line 8). It would have been obvious to one of ordinary skill in the art at the time the invention was made for the file data to be an Extensible Markup Language. This would improve the versatility of the system by allowing an additional input data format to be used.

17. Claims 12-14 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Takashima, as applied to claim 1 above, and in further view of Hoshino, *et al.*

(4,912,491). With regard to claim 12, the combination of Vennekens and Takashima discloses the invention as stated in claim 1. Vennekens further discloses wherein the printing system having a plurality of image-forming sections for forming images in multiple colors (inherent in color printer), and image-forming controller unit for controlling image-forming operations in the plurality of image-forming sections (inherent in marking engine 43), and a data-supplying controller unit for controlling operations for supplying image data for the individual colors to said image-forming controller unit (inherent in color printer), said data-supplying controller including the plurality of processors (sub-process 1, sub-process 2, figure 1), and wherein the data-supplying controller including the plurality of processors (sub-process 1, sub-process 2, figure 1). Vennekens does not disclose wherein the data-supplying controller unit sequentially supplies the image data for the individual colors to the image-forming controller unit with timing that allows the images for the individual colors to be overlapped and formed in the plurality of image-forming sections on the basis of a vertical synchronizing signal inputted from a vertical synchronizing signal line, the number of which is fewer than the number of the aforementioned image-forming sections. Hoshino teaches a circuit for generating a vertical synchronizing circuit for printing multiple colors (figure 2, column 3, lines 16-18). It would have been obvious to one of ordinary skill in the art at the time the invention was made for the data-supplying controller unit to sequentially supply the image data for the individual colors to the image-forming controller unit with timing that allows the images for the individual colors to be overlapped and formed in the plurality of image-forming sections on the basis of a vertical synchronizing signal inputted from a vertical synchronizing signal line, the number of which is fewer than the number

of the aforementioned image-forming sections. This would improve the printing of each color by synchronizing their printing with the vertical synchronizing signal.

18. With regard to claim 13, the combination of Vennekens, Takashima and Hoshino discloses the invention as stated in claim 12. Hoshino further discloses, in lines 4-5 of column 5, that a single piece of the vertical synchronizing signal line is provided.

19. With regard to claim 14, the combination of Vennekens, Takashima and Hoshino discloses the invention as stated in claim 12. Hoshino further discloses that the timing is set in the data-supplying controller unit ("stored in margin registers", column 5, lines 18-21) as information about the difference in time from the vertical synchronizing signal ("amounts of delay", column 5, lines 14-18).

20. With regard to claim 19, the combination of Vennekens, Takashima and Hoshino discloses the invention as stated in claim 14. Hoshino further discloses wherein the information about the difference in time is set as the number of pulses of horizontal synchronizing signals ("amounts of delay of the horizontal timing signals", column 5, lines 22-23). It is inherent that these signals are outputted from the image-forming controller unit to the data-supplying controller unit since these are the only appropriate devices for this type of communication.

21. With regard to claim 20, the combination of Vennekens, Takashima and Hoshino discloses the invention as stated in claim 19. It is inherent that the number of pulses is supplied as a difference in the number of pulses from a predetermined reference since a difference must be measured relative to a reference value.

22. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens, Takashima and Hoshino, as applied to claim 12 above, and in further view of Keller, *et al.*

(4,975,862). The combination of Vennekens, Takashima and Hoshino discloses the invention as stated in claim 12. Hoshino further discloses wherein the timing is supplied from the image-forming controller unit to the data-supplying controller unit to the data-supplying controller unit as information about the difference in time from the vertical synchronizing signal ("amounts of delay of the vertical timing signals", column 5, lines 15-16). The combination does not disclose wherein the information is obtained according to the amounts of color deviations among the individual colors and measurement of the color deviations is performed in the image-forming controller unit. Keller teaches, in lines 10-13 of column 3, obtaining information (sensitivity matrix) from amounts of color deviations in a printing device. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the information to be obtained according to the amounts of color deviations among the individual colors and measurement of the color deviations is performed in the image-forming controller unit. This would improve the printing quality since the colors could be more accurately synchronized on the output device.

23. With regard to claim 16, the combination of Vennekens, Takashima, Hoshino and Keller discloses the invention as stated in claim 15. It is inherent that the measurement of the color deviations among the individual colors is performed in response to a command transmitted from the data-supplying controller unit since this unit is used to control all such aspects.

24. With regard to claim 17, the combination of Vennekens, Takashima, Hoshino and Keller discloses the invention as stated in claim 15. It is known in the art to transmit data via a serial communication line.

25. With regard to claim 18, the combination of Vennekens, Takashima, Hoshino and Keller discloses the invention as stated in claim 15. It is inherent that the information about the difference in time is supplied as information about a difference in time from a predetermined reference difference in time since a difference must be measured relative to a reference value.

26. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens, Takashima and Hoshino, as applied to claim 12 above, and in further view of Satoh, *et al.* (5,270,769). The combination of Vennekens, Takashima and Hoshino discloses the invention as stated in claim 21. The combination does not disclose wherein, in the printing system, the plurality of image-forming controller sections comprises primary transcribing means for overlapping the individual color images and primarily transcribing the images on an intermediate transcribing belt and secondary transcribing means for secondarily transcribing the overlapped images on a recording medium. Satoh teaches a printing system (figure 1), comprising a primary transcribing means ("developing device", column 7, line 29) for overlapping the individual color images (B-, C-, M- and Y- color toner images, column 7, lines 34-35) and primarily transcribing the images on an intermediate transcribing belt ("intermediate transfer belt", column 7, lines 36-37) and secondary transcribing means ("transfer roller", column 7, line 38) for secondarily transcribing the overlapped images on a recording medium ("copy sheet", column 7, line 43). It would have been obvious to one of ordinary skill in the art at the time the invention was made for the plurality of image-forming controller sections to comprise primary transcribing means for overlapping the individual color images and primarily transcribing the images on an intermediate transcribing belt and secondary transcribing means for secondarily transcribing the overlapped

images on a recording medium. This is known in the art as an efficient way of printing color images.

27. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Takashima, as applied to claim 6 above, and in further view of Ishikawa, *et al.* (5,987,226). The combination of Vennekens and Takashima discloses the invention as stated in claim 6. The combination does not disclose wherein each queue includes information indicating estimation time required in completing the assigned jobs by each processor, and wherein said assigning steps selects one of the plurality of processors, which the estimation time in the queue is shorter than others. Ishikawa teaches, in lines 12-15 of column 7, a printing system with a tag including an estimated processing time for transferring a print job. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the queue of the combination of Vennekens and Takashima to include information indicating estimation time required in completing the assigned jobs by each processor. This would increase efficiency by keeping track of which processors are faster. It would have been obvious to one of ordinary skill in the art at the time the invention was made for said assigning steps to select one of the plurality of processors, which the estimation time in the queue is shorter than others. This would increase the overall speed of the system.

28. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens, Takashima and Carelton, as applied to claim 9 above, and in further view of Sharp, *et al.* (5,557,297). With regard to claim 10, the combination of Vennekens, Takashima and Carelton discloses the invention as stated in claim 9. The combination does not disclose wherein the conversion unit includes a video-graphics processing unit processing data for display, the video-

graphics processing unit providing raster image data of a predetermined size, and wherein the conversion unit divides a page of data in the file data into a plurality of segments, and converts the segment data into raster image data, and said producing step combines the raster image data of the plurality of segments in to the page of raster image data. Sharp teaches, in lines 8-14 of column 9, a conversion unit and video-graphics processing unit, for displaying raster image data. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the conversion unit to include a video-graphics processing unit processing data for display, the video-graphics processing unit providing raster image data of a predetermined size. This would improve the usefulness of the system since it would allow data to be displayed on a monitor. Vennekens discloses dividing a page of data in the file into a plurality of segments ("intermediate data stream portions", column 3, lines 15-16) and converting the segment data into raster image data ("generates a bitmap representation", column 14, line 30), and said producing step combines the raster image data of the plurality of segments in to the page of raster image data ("combined to one intermediate data stream", column 13, line 43).

29. With regard to claim 24, the combination of Vennekens, Takashima, Carelton and Sharp discloses the invention as stated in claim 23. Vennekens further discloses wherein the conversion unit assigns tag information into each segment data ("data commands", column 13, lines 33-34), and wherein said producing step performs the combining process based on the tag information ("combined to one intermediate data stream", column 13, line 43).

30. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens in view of Ludlow, *et al.* (5,412,483). With regard to claim 25, Vennekens discloses an image processing method in a printing system (figure 1) for converting file data to bitmapimage data

("converting a data stream in page description language ... into a bitmap representation", column 1, lines 5-9) by a plurality of processors (inherent from sub-process 1 & 2, elements 36 and 37 of figure 1), each processor performing a conversion process of an assigned job to bit map image data ("generates a bitmap representation", column 14, line 30) and providing a plurality of page of bit map image data in order to a printing engine (bitmap representation 42 and marking engine 43, figure 1), the printing engine printing the provided page of the bit map image data at a constant speed ("writes the image represented by the bitmap representation", column 14, lines 30-32) on a recording medium ("on the hard copy", column 14, lines 32-33), the image processing method comprising the steps of: receiving a page description language format of data ("master process 32 receives the PDL data stream", column 5, lines 55-58), including attribution information ("control commands", column 5, line 37), the attribution information indicating at least a data structure of plural pages in the received data and type of objects which constitutes the page description language format data ("extended control commands can define ... extended data structures", column 5, lines 37-38); analyzing the attribution information included in the received page description language format of data (column 6, lines 19-20); assigning each object in the received page description language format data to the plurality of processors as jobs of conversion processes independently to a completion of the conversion processes for one page ("generate independent PDL data stream segments", column 6, lines 21-22); receiving bit map image data of each job from the plurality of processors irrelevant to a page order and storing the received bit map image data from the plurality of processors into a memory having a memory capacity for storing plural pages of bit map image data ("each processor has an independent memory, required to keep the data", column 7, lines 2-9); and producing the bit map image data

stored in the memory in page order to the printing engine ("the bitmap representation is sent to a marking engine", column 14, lines 29-36). Vennekens does not disclose receiving file data from an external termainal. Ludlow teaches, in lines 64-66 of column 7, receiving PDL files for printing from an external terminal. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the image processing method of Vennekens to receive file data from an external terminal and for this file data to be the data processed according to the claim. This would improve the versatility of the system by allowing external files to be printed.

31. With regard to claim 26, Vennekens in view of Ludlow discloses the invention as stated in claim 25. It would have been obvious to one of ordinary skill in the art at the time the invention was made, in a case of assigning one object to one processor, said assigning step selects one of the plurality of processors, which finishes a conversion process of the object to raster image data earlier than others. This would increase the overall speed of the system.

32. With regard to claim 27, Vennekens in view of Ludlow discloses the invention as stated in claim 26. Vennekens further discloses that each processor has a queue ("independent memory", column 7, line 4). It is inherent that the assigning step assigns each object to one of the queues of the processors, and each processor performs the conversion process based on information of the job stored in the queue. This must be the case since all processors have a queue ("independent memory") and all objects are assigned to a processor.

33. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Ludlow, as applied to claim 27 above, and in further view of Ishikawa. The combination of Vennekens and Ludlow discloses the invention as stated in claim 27. The combination does not disclose wherein each queue includes information indicating estimation time required in

completing the assigned jobs by each processor, and wherein said assigning steps selects one of the plurality of processors, which the estimation time in the queue is shorter than others. Ishikawa teaches, in lines 12-15 of column 7, a printing system with a tag including an estimated processing time for transferring a print job. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the queue of the combination of Vennekens and Ludlow to include information indicating estimation time required in completing the assigned jobs by each processor. This would increase efficiency by keeping track of which processors are faster. It would have been obvious to one of ordinary skill in the art at the time the invention was made for said assigning steps to select one of the plurality of processors, which the estimation time in the queue is shorter than others. This would increase the overall speed of the system.

34. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Ludlow, as applied to claim 25 above, and in further view of Carelton. With regard to claim 29, the combination of Vennekens and Ludlow discloses the invention as stated in claim 25. The combination does not disclose wherein the printing system having a conversion unit converting, into bitmap image data, file data other than the page description language format data, and wherein, in a case where the file data other than the page description language format data is received, said analyzing step recognizes, based on attribution information included in the received file data, that the file data other than the page description language format data has been received, and said assigning step assigns a job of the conversion process of the received file data to the conversion unit. Carleton teaches, in lines 64-65 of column 9, converting GDI data, which is data other than the page description language format data, into raster data. It would have been

obvious to one of ordinary skill in the art at the time the invention was made for the printing system having a conversion unit converting, into raster image data, file data other than the page description language data. This would improve the versatility of the system by increasing the number of input data formats that could be used. It is inherent that in such a case, said analyzing step would recognize, based on attribution information included in the received file data, that the file data other than the page description language format data has been received, in order to properly handle the data. The assigning step would then assign a job of conversion process of the received file data to the conversion unit.

35. With regard to claim 30, the combination of Vennekens, Ludlow and Carelton discloses the invention as stated in claim 29. Carelton further discloses, in lines 64-65 of column 9, that the file data in question is GDI, or Graphic Display Interface format of data.

36. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens, Ludlow and Carelton, as applied to claim 29 above, and in further view of Alam. The combination of Vennekens, Ludlow and Carelton discloses the invention as stated in claim 29. The combination does not disclose wherein the file data is an Extensible Markup Language format of data. Alam teaches converting from Extensible Markup Language (column 2, line 5) to bitmap (column 2, line 8). It would have been obvious to one of ordinary skill in the art at the time the invention was made for the file data to be an Extensible Markup Language. This would improve the versatility of the system by allowing an additional input data format to be used.

37. Claims 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens, Ludlow and Carelton, as applied to claim 29 above, and in further view of Sharp. With regard to claim 32, the combination of Vennekens, Ludlow and Carelton discloses the invention as stated

in claim 29. The combination does not disclose wherein the conversion unit includes a video-graphics processing unit processing data for display, the video-graphics processing unit providing bitmap image data of a predetermined size, and wherein the conversion unit divides a page of data in the file data into a plurality of segments, and converts the segment data into bitmap image data, and said producing step combines the bitmap image data of the plurality of segments into the page of bitmap image data. Sharp teaches, in lines 8-14 of column 9, a conversion unit and video-graphics processing unit, for displaying raster image data. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the conversion unit to include a video-graphics processing unit processing data for display, the video-graphics processing unit providing raster image data of a predetermined size. This would improve the usefulness of the system since it would allow data to be displayed on a monitor.

38. With regard to claim 33, the combination of Vennekens, Ludlow, Carelton and Sharp discloses the invention as stated in claim 32. Vennekens further discloses wherein the conversion unit assigns tag information into each segment data ("data commands", column 13, lines 33-34), and wherein said producing step performs the combining process based on the tag information ("combined to one intermediate data stream", column 13, line 43).

39. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Ludlow, as applied to claim 25 above, and in further view of Takashima. The combination of Vennekens and Ludlow discloses the invention as stated in claim 25. Vennekens further discloses wherein the printing system comprises a printing engine (marking engine 43, figure 1) for continuously receiving color image data (bitmap representation 42, figure 1) having at least three color components ("cyan, magenta, yellow and black", column 1, line 40) in page unit

(inherent from "each segment describes an image to be printed on an individual page", column 4, lines 7-9) and for printing the at least three color components of color image data on a recording medium in parallel at a constant speed ("running on several processors parallelly", column 3, lines 9-13), wherein said receiving step receives a page description language format of data ("master process 32 receives the PDL data stream", column 5, lines 55-58) including at least two of the at least three color components (inherent when sending a color image) as at least an object constituting the page description format data (inherent from "PDL data stream 31", figure 1). Vennekens does not disclose wherein the assigning step divides the object of the at least two color components into each color component data, and assigns each color component data as an independent job to at least two of the plurality of processors so that the two processors independently convert that at least two color component data into bit map image data of the at least two color components in parallel. Takashima teaches, in lines 22-31 of column 5, a parallel processing system where each color component for printing is processed with a different processor. It would have been obvious to one of ordinary skill in the art at the time the invention was disclose wherein the assigning step divides the object of the at least two color components into each color component data, and assigns each color component data as an independent job to at least two of the plurality of processors so that the two processors independently convert that at least two color component data into bit map image data of the at least two color components in parallel. This modification will improve the printing time by parallel processing the different print colors.

40. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens in view of Ludlow. Vennekens discloses an image processing method in a printing system (figure

1). Vennekens does not disclose receiving file data form an external terminal. . Ludlow teaches, in lines 64-66 of column 7, receiving PDL files for printing from an external terminal. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the image processing method of Vennekens to receive file data from an external terminal and for this file data to be the data processed according to the claim. This would improve the versatility of the system by allowing external files to be printed. Vennekens further discloses converting a file data to bit map image data by a plurality of processors (sub-process 1, sub-process 2, figure 1), each processor performing a conversion process of an assigned job to bit map image data ("converting a data stream in page description language ... into a bitmap representation", column 1, lines 5-9) and providing a plurality of page of bit map image data in order to a printing engine ("bitmap representation is sent to a marking engine", column 14, lines 30-34), the printing engine printing the provided page of the bit map image data at a constant speed ("writes the image represented by the bitmap representation", column 14, lines 31-32) on a recording medium ("on the hard copy", column 14, lines 32-33), the image processing method comprising the steps of: receiving a page description language format of data ("master process 32 receives the PDL data stream", column 5, lines 55-58), including attribution information from the external terminal ("control commands", column 5, line 37), the attribution information indicating at least a data structure of plural pages in the received data and type of objects which constitutes the page description language format data ("extended control commands can define ... extended data structures", column 5, lines 37-38); analyzing the attribution information included in the received page description language format of data (column 6, lines 19-20); assigning each object in the received page description language format data to each queue

("independent memory", column 7, line 4) of the plurality of processors as jobs of conversion processes independently to a completion of the conversion processes for one page ("generate independent PDL data stream segments", column 6, lines 21-22), each of the plurality of processors performing each conversion process of the assigned jobs in each queue (inherent since all processors have a queue and all objects are assigned to a processor); receiving bit map image data of each job from the plurality of processors irrelevant to a page order and storing the received bit map image data from the plurality of processors into a memory having a memory capacity for storing plural pages of bit map image data ("each processor has an independent memory, required to keep the data", column 7, lines 2-9); and producing the bit map image data stored in the memory in page order to the printing engine ("the bitmap representation is sent to a marking engine", column 14, lines 29-36).

41. With regard to claim 36, Vennekens in view of Ludlow discloses the invention as stated in claim 35. It would have been obvious to one of ordinary skill in the art at the time the invention was made, in a case of assigning one object to one processor, said assigning step selects one of the plurality of processors, which finishes a conversion process of the object to raster image data earlier than others. This would increase the overall speed of the system.

42. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Ludlow, as applied to claim 36 above, and in further view of Ishikawa. The combination of Vennekens and Ludlow discloses the invention as stated in claim 6. The combination does not disclose wherein each queue includes information indicating estimation time required in completing the assigned jobs by each processor, and wherein said assigning steps selects one of the plurality of processors, which the estimation time in the queue is shorter than others.

Ishikawa teaches, in lines 12-15 of column 7, a printing system with a tag including an estimated processing time for transferring a print job. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the queue of the combination of Vennekens and Ludlow to include information indicating estimation time required in completing the assigned jobs by each processor. This would increase efficiency by keeping track of which processors are faster. It would have been obvious to one of ordinary skill in the art at the time the invention was made for said assigning steps to select one of the plurality of processors, which the estimation time in the queue is shorter than others. This would increase the overall speed of the system.

43. Claims 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Ludlow, as applied to claim 35 above, and in further view of Carelton. With regard to claim 39, the combination of Vennekens and Ludlow discloses the invention as stated in claim 1. The combination does not disclose wherein the printing system having a conversion unit converting, into bitmap image data, file data other than the page description language format data, and wherein, in a case where the file data other than the page description language format data is received, said analyzing step recognizes, based on attribution information included in the received file data, that the file data other than the page description language format data has been received, and said assigning step assigns a job of the conversion process of the received file data to the conversion unit. Carleton teaches, in lines 64-65 of column 9, converting GDI data, which is data other than the page description language format data, into raster data. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the printing system having a conversion unit converting, into raster image data, file data other than the page

description language data. This would improve the versatility of the system by increasing the number of input data formats that could be used. It is inherent that in such a case, said analyzing step would recognize, based on attribution information included in the received file data, that the file data other than the page description language format data has been received, in order to properly handle the data. The assigning step would then assign a job of conversion process of the received file data to the conversion unit.

44. With regard to claim 39, the combination of Vennekens, Ludlow and Carelton discloses the invention as stated in claim 38. Carelton further discloses, in lines 64-65 of column 9, that the file data in question is GDI, or Graphic Display Interface format of data.

45. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Ludlow and Carelton, as applied to claim 38 above, and in further view of Alam (6,336,124). The combination of Vennekens, Ludlow and Carelton discloses the invention as stated in claim 38. The combination does not disclose wherein the file data is an Extensible Markup Language format of data. Alam teaches converting from Extensible Markup Language (column 2, line 5) to bitmap (column 2, line 8). It would have been obvious to one of ordinary skill in the art at the time the invention was made for the file data to be an Extensible Markup Language. This would improve the versatility of the system by allowing an additional input data format to be used.

46. Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens, Ludlow and Carelton, as applied to claim 38 above, and in further view of Sharp. With regard to claim 41, the combination of Vennekens, Ludlow and Carelton discloses the invention as stated in claim 38. The combination does not disclose wherein the conversion unit includes a video-graphics processing unit processing data for display, the video-graphics processing unit

providing bitmap image data of a predetermined size, and wherein the conversion unit divides a page of data in the file data into a plurality of segments, and converts the segment data into bitmap image data, and said producing step combines the bitmap image data of the plurality of segments in to the page of bitmap image data. Sharp teaches, in lines 8-14 of column 9, a conversion unit and video-graphics processing unit, for displaying raster image data. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the conversion unit to include a video-graphics processing unit processing data for display, the video-graphics processing unit providing raster image data of a predetermined size. This would improve the usefulness of the system since it would allow data to be displayed on a monitor.

47. With regard to claim 42, the combination of Vennekens, Ludlow, Carelton and Sharp discloses the invention as stated in claim 41. Vennekens further discloses wherein the conversion unit assigns tag information into each segment data ("data commands", column 13, lines 33-34), and wherein said producing step performs the combining process based on the tag information ("combined to one intermediate data stream", column 13, line 43).

48. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens and Ludlow, as applied to claim 35 above, and in further view of Takashima. The combination of Vennekens and Ludlow discloses the invention as stated in claim 35. Vennekens further discloses wherein the printing system comprises a printing engine (marking engine 43, figure 1) for continuously receiving color image data (bitmap representation 42, figure 1) having at least three color components ("cyan, magenta, yellow and black", column 1, line 40) in page unit (inherent from "each segment describes an image to be printed on an individual page", column 4, lines 7-9) and for printing the at least three color components of color image data on a recording

medium in parallel at a constant speed ("running on several processors parallelly", column 3, lines 9-13), wherein said receiving step receives a page description language format of data ("master process 32 receives the PDL data stream", column 5, lines 55-58) including at least two of the at least three color components (inherent when sending a color image) as at least an object constituting the page description language format data (inherent from "PDL data stream 31", figure 1). Vennekens does not disclose wherein the assigning step divides the object of the at least two color components into each color component data, and assigns each color component data as an independent job to at least two of the plurality of processors so that the two processors independently convert that at least two color component data into bit map image data of the at least two color components in parallel. Takashima teaches, in lines 22-31 of column 5, a parallel processing system where each color component for printing is processed with a different processor. It would have been obvious to one of ordinary skill in the art at the time the invention was disclose wherein the assigning step divides the object of the at least two color components into each color component data, and assigns each color component data as an independent job to at least two of the plurality of processors so that the two processors independently convert that at least two color component data into bit map image data of the at least two color components in parallel. This modification will improve the printing time by parallel processing the different print colors.

49. Claims 44-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vennekens in view of Takashima. With regard to claim 44, Vennekens discloses a printer controller apparatus (figure 1) including a plurality of parallel developing means (sub-process 1, sub-process 2, figure 1) for developing print data into image data (inherent in marking engine 41,

figure 1), comprising: receiving means (master process 32, figure 1) for receiving a plurality of pages of print data (PDL data stream 31, figure 1), said plurality of pages having a designated order (inherent in page description language). Vennekens does not disclose generating means for generating a plurality of component data corresponding to each color component from each page of print data received from said receiving means and first control means for controlling said plurality of parallel developing means, said first control means assigning said color component data generated by said generating means to said plurality of developing means according to a respective type of said corresponding color component, said plurality of parallel developing means generating image data from the color component data. Takashima teaches, in lines 22-31 of column 5, a printing system where separate colors are processed in parallel by separate processors. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the printing controller apparatus of Vennekens to include generating means for generating a plurality of component data corresponding to each color component from each page of print data received from said receiving means and first control means for controlling said plurality of parallel developing means, said first control means assigning said color component data generated by said generating means to said plurality of developing means according to a respective type of said corresponding color component, said plurality of parallel developing means generating image data from the color component data. This would improve the speed of the printing system since different colors could be processed in parallel. Vennekens further discloses means for storing said image data generated by said plurality of parallel developing means independent of said page order ("independent memory", column 7, lines 2-9) and second control means for controlling output of said stored image data on a printing apparatus

based on said page order ("bitmap representation is sent to a marking engine", column 14, lines 30-34).

50. With regard to claim 45, the combination of Vennekens and Takashima discloses the invention as stated in claim 44. It would have been obvious to one of ordinary skill in the art at the time the invention was made for the output of the image data by the second control to be based on an ordering of colors to be outputted on said printing apparatus according to the teaching of Takashima that each color is processed in parallel on a different processor. This would ensure that the colors are recombined properly.

51. With regard to claim 46, the combination of Vennekens and Takashima discloses the invention as stated in claim 44. IT is inherent that the color components would be outputted by page since the data of Vennekens is in PDL format.

52. With regard to claim 47, the combination of Vennekens and Takashima discloses the invention as stated in claim 44. Venneken further discloses wherein said generating means divides each page into at least two objects ("intermediate data stream portions", column 3, lines 15-16) and generates component data corresponding to a color component for each object ('each segment describes an image to be printed on an individual page", column 4, lines 8-9).

53. With regard to claim 48, the combination of Vennekens and Takashima discloses the invention as stated in claim 44. It is inherent in parallel processing to assign tasks to unused processors. Therefore, it is inherent that while at least one of said plurality of parallel developing means is processing component data of one page, said first control means assigns compnent data of another page to unused ones of said plurality of parallel developing means.

54. With regard to claim 49, the combination of Vennekens and Takashima discloses the invention as stated in claim 44. It is inherent in parallel processing that extra jobs are assigned to unused processors. Therefore, it is inherent that wherein said receiving means receives print data for more than one print job, and wherein while at least one of said plurality of parallel developing means is processing component data of one print job, said first control means assigns component data of an other print job unused ones of said plurality of parallel developing means.

55. With regard to claim 50, the combination of Vennekens and Takashima discloses the invention as stated in claim 44. Vennekens further discloses wherein said plurality of parallel developing means is executed by one processing unit (master process 32, figure 1).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Foster whose telephone number is (703)305-1900. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore can be reached on (703)308-7452. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

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